

WHAT IS CLAIMED IS:

1. A method for providing customer support for a product, comprising:  
receiving one or more queries regarding a product from a customer;  
5 extracting one or more query key words from each of the queries;  
extracting one or more answers from product FAQ's related to the received  
queries from a product FAQ database;  
extracting one or more FAQ key words from the extracted answers;  
transforming the extracted query and FAQ key-words into unique numerical  
10 representations such that the transformed unique numerical representations do not  
result in multiple similar numerical representations, to avoid ambiguous prediction  
of meaning of the translated words in the received queries and extracted answers;  
representing the transformed query and FAQ key-words into query vector  
forms and product FAQ vector forms, respectively;  
15 applying a convolution algorithm to each of the query vector forms, with  
each of the product FAQ vector forms separately and obtains one or more  
appropriate answers to the queries; and  
automatically communicating the answers to the queries received from the  
customer.  
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2. The method of claim 1, wherein the product comprises:  
a product selected from the group consisting of multiple products and  
multiple services.
- 25 3. The method of claim 1, further comprising:  
receiving queries from the customer through inputs selected from the group  
consisting of a letter, a telephone, an e-mail and Internet; and  
translating the received queries into a text.

4. The method of claim 3, wherein translating the received queries through a letter comprises:  
manually entering the text in the received queries into a buffer.
- 5 5. The method of claim 3, wherein translating the received queries through a telephone comprises:  
converting the received queries into a text using a voice recognition system.
6. The method of claim 3, further comprising:  
10 storing the translated queries into a buffer;  
categorizing the stored queries based on the type of query; and  
analyzing the categorized queries to determine whether the queries can be answered automatically to the customer.
- 15 7. The method of claim 6, wherein categorizing the stored queries comprises:  
categorizing the received queries based on various categories selected from the group consisting of product category, mindset of customer, topic, type of customer, and nature of query.
- 20 8. The method of claim 7, further comprising:  
manually communicating the answers to the customer based on categorization of the queries.
9. The method of claim 1, wherein extracting one or more key-words  
25 comprises:  
extracting key-words based on specific criteria selected from the group consisting of removing one or more general words from the queries and product FAQs, removing all words including three or fewer letters, and removing one or more rarely used words.

10. The method of claim 9, wherein extracting one or more key-words further comprises:

- 5 replacing the extracted key-words with appropriate synonyms; and  
stemming the replaced key-words using a Modified Porters Stemming Algorithm.

11. The method of claim 10, wherein stemming the replaced key-words comprises:

- 10 applying the Modified Porters Stemming Algorithm to each of the replaced key-words until no more stemming can be performed on the replaced key-words.

12. The method of claim 1, further comprising:  
normalizing each of the transformed unique numerical representations.

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13. The method of claim 12, wherein normalizing the numerical representations comprises:

normalizing based on minimum/ maximum values in the transformed unique numerical representations.

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14. The method of claim 13, wherein representing the key-words in the vector forms comprises:

representing the vector forms using the normalized unique numerical representations.

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15. The method of claim 1, wherein representing the key-words in the vector forms comprises:

representing a size of the vector forms based on a pre-determined number of key-words.

16. The method of claim 15, wherein the predetermined number is in the range of about 10 to 15 key-words.

5 17. The method of claim 1, wherein applying the convolution algorithm further comprises:

applying a self-convolution algorithm to each of the query vector forms to obtain resultant convoluted representation of the query;

10 applying the convolution algorithm to the query vector form with each of the product FAQ vector forms to obtain resultant convoluted representation of the FAQ answers; and

comparing the resultant convoluted representation of the query and the FAQ answers to determine appropriate answers to the queries.

15 18. The method of claim 1, wherein communicating automatically to the customer's queries comprises:

automatically communicating the answers to the customers using communication methods selected from the group consisting of a letter, an e-mail, internet, and a telephone.

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19. A computer-implemented system for providing automated customer support for a product, comprising:

a web server to receive one or more queries regarding the product from a customer;

25 a FAQ extractor coupled to the web server that extracts one or more corresponding answers in product FAQs from respective product FAQ databases;

a key-word extractor coupled to the web server and the FAQ extractor extracts one or more key-words from the received queries and the corresponding extracted product FAQs, wherein the key-word extractor transforms each of the

extracted key-words into a unique numerical representation so that the transformed unique numerical representations do not result in multiple similar numerical representations, to avoid ambiguous prediction of meaning from the transformed unique numerical representations; and

- 5            an analyzer coupled to the key-word extractor that represents the transformed words into respective query and product FAQ vector forms, wherein the analyzer applies a convolution algorithm to each of the query vector forms, with each of the product FAQ vector forms separately and obtains one or more appropriate answers to the queries, and wherein the analyzer automatically
- 10        communicates the answers to the queries received from the customer.

20.        The system of claim 19, wherein the web server receives the queries from inputs selected from the group consisting of a letter, a telephone, an e-mail and Internet.

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21.        The system of claim 19, wherein the web server translates the received queries into a text.

22.        The system of claim 21, wherein the web server manually enters the text in

20        the received queries through the letter.

23.        The system of claim 21, wherein the web server translates the received queries from the telephone into a text using a voice recognition system.

25        24.        The system of claim 21, wherein the web server stores the received queries into a buffer.

25.        The system of claim 21, further comprising:

a categorizer coupled to the web server that categorizes the received queries based on a type of query, wherein the analyzer further analyzes the categorized queries to determine whether the answers to the queries can be automatically communicated to the customer.

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26. The system of claim 25, wherein the categorizer categorizes the queries based on categories selected from the group consisting of product category, mindset of customer, topic, type of customer, and nature of query.

10 27. The system of claim 25, wherein the analyzer manually communicates answers to the customer based on the categorized queries.

15 28. The system of claim 19, wherein the key-word extractor extracts key-words based on specific criteria selected from the group consisting of removing one or more general words from the queries and product FAQs, removing all words including three or fewer letters, and removing one or more rarely used words.

20 29. The system of claim 28, wherein the key-word extractor replaces the extracted key-words with appropriate synonyms, and further stems the replaced key-words using a Modified Porters Stemming Algorithm.

30. The system of claim 29, wherein the key-word extractor applies the Modified Porters Stemming Algorithm to each of the replaced words until no more stemming can be performed on the replaced key-word.

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31. The system of claim 19, wherein the key-word extractor normalizes each of the transformed numerical representations.

32. The system of claim 31, wherein the key-word extractor normalizes based on minimum/ maximum values in the transformed unique numerical representations.

33. The system of claim 19, wherein the analyzer forms the query and product  
5 FAQ vector form sizes based on a predetermined number of key-words.

34. The system of claim 33, wherein the predetermined number of key-words is in the range of about 10 to 15 key-words.

10 35. The system of claim 19, wherein the analyzer applies a self-convolution algorithm to each of the query vector forms to obtain resultant convoluted representation of the query, and the analyzer applies the convolution algorithm to the query vector form with each of the product FAQ vector forms to obtain resultant convoluted representation of the FAQ answers, and wherein the analyzer further  
15 compares the resultant convoluted representation of the query and the FAQ answers to determine one or more appropriate answers to the queries.

36. The system of claim 19, wherein the analyzer communicates the answers  
20 automatically to the customers using communicating methods selected from the group consisting of letters, e-mails, internet and telephones.

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